

New record and ecological notes of *Phimophorus spissicornis* (Hemiptera: Heteroptera: Reduviidae: Phimophorinae) in Colombia

Nuevo registro y notas ecológicas de *Phimophorus spissicornis* (Hemiptera: Heteroptera: Reduviidae: Phimophorinae) en Colombia

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Abstract: *Phimophorus spissicornis*, the enigmatic and exclusively Neotropical representative of the Phimophorinae (Heteroptera: Reduviidae), is recorded for the first time from Colombia. Six adult specimens and one nymph were collected in the municipalities of Vegachí and San Carlos, department of Antioquia. In both localities *P. spissicornis* was collected from palms (Arecaceae) in association with *Rhodnius pallescens* (Reduviidae: Triatominae). *Phimophorus spissicornis* was found on the axils of palm fronds of *Attalea butyracea* and *Oenocarpus bataua*. Dorsal habitus illustrations of the male, female, and late instar nymph of *P. spissicornis* are provided.

Key words: *Attalea. Rhodnius pallescens. Arecaceae.*

Resumen: *Phimophorus spissicornis*, el enigmático representante exclusivamente neotropical de Phimophorinae (Heteroptera: Reduviidae), se registra por primera vez para Colombia. Seis especímenes adultos y una ninfa fueron recolectados en los municipios de Vegachí y San Carlos, departamento de Antioquia. En ambas localidades *P. spissicornis* fue recolectado en palmas (Arecaceae) en asociación con *Rhodnius pallescens* (Reduviidae: Triatominae). *Phimophorus spissicornis* se encontró en las brácteas de las palmas *Attalea butyracea* y *Oenocarpus bataua*. Se presentan imágenes del hábito en vista dorsal para macho, hembra y último instar de *P. spissicornis*.

Palabras clave: *Attalea. Rhodnius pallescens. Arecaceae.*

Introduction

Phimophorinae Handlirsch, 1897 (Heteroptera: Reduviidae) is a small and enigmatic assassin bug subfamily, with just two genera and three species known, the monotypic *Phimophorus* Bergroth, 1886 and *Mendanocoris* Miller, 1956, with two species (Maldonado 1990). *Phimophorus spissicornis* Bergroth, 1886 is the only Neotropical representative (Usinger and Wygodzinsky 1964; Maldonado 1990). Among the Reduviidae subfamilies, Phimophorinae can be distinguished by the following combination of characters: presence of waxy secretions on the cuticle; body depressed; antennae inserted at the apex of head, distal flagellomere reduced; antenniferous tubercles plate-like, covering the insertions of the antennae; buccula present; prosternal sulcus with lateral shield-like structures; and bisegmented tarsus (Usinger and Wygodzinsky 1964). *Phimophorus* can be distinguished from *Mendanocoris* by having the distal flagellomere free; the clypeus reduced; the labrum very small; the buccula closed anteriorly; and by the different shape of the pronotum (Usinger and Wygodzinsky 1964).

The systematic placement of Phimophorinae has been problematic and widely discussed (Bergroth 1886; Handlirsch 1897a, b; Usinger 1943; Wygodzinsky 1948; Carayon *et al.* 1958; Usinger and Wygodzinsky 1964). Furthermore, the phylogenetic position of *Phimophorus* in Reduviidae is

unknown primarily because specimens are very scarce in collections, thereby preventing its inclusion in cladistic analyses of the family (*e.g.*, Weirauch 2008). Additional specimens of this genus are needed for future phylogenetic analyses.

Phimophorus has been recorded so far from Brazil and Ecuador (Carayon *et al.* 1958; Lent and Jurberg 1977). Because specimens of *Phimophorus* are seldom collected, little is known about its biology and natural history (Schuh and Slater 1995). The only biological information available for *P. spissicornis* is its association with bananas and bromeliads. The specimens on bananas were intercepted at ports of entry in the United States (Carayon *et al.* 1958), while the specimens from bromeliads came from a single collection event (Lent and Jurberg 1977; Lent and Wygodzinsky 1979); therefore, no generalizations can be made from these data.

As part of the Triatominae survey efforts by the Grupo de Chagas of the Universidad de Antioquia, several specimens of *Phimophorus* were collected in 1990 and 2006. In this paper we present the first formal record of the subfamily Phimophorinae for Colombia and provide detailed information on the habitat of *P. spissicornis*.

Materials and Methods

Specimens of *P. spissicornis* (Fig. 1) were initially collected at San Carlos (Department of Antioquia) in February 1990.

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The municipality of San Carlos is in the east region of Antioquia. There the mean annual temperature is 23°C, annual rainfall is 2,000 mm and elevation 1,000 m. The surveyed locality was “vereda Jardín, Finca El Silencio” (06°07′45″N, 74°49′57″W). The locality was visited in February 1990 during the dry season. A total of 13 palms of *Oenocarpus bataua* Mart., 1823 (Arecaceae) were examined. Because specimens of *P. spissicornis* were found among specimens of *Rhodnius pallescens* Barber, 1932 (Reduviidae: Triatominae) in San Carlos, additional fieldwork intending to collect *R. pallescens* prompted the search for specimens of *Phimophorus* in Vegachí and Victoria during 2006.

The municipality of Vegachí is located in the Northeast of Antioquia. The mean annual temperature is 23°C, mean relative humidity 75%, and mean annual rainfall is 2,100 mm. The locality is a rural zone about 1 km east from the municipality town, at 982 m elevation (6°46′01″N, 74°47′40″W). This locality was visited in September 2006 during the rainy season. Two palms of *Attalea butyracea* (Mutis ex L. f.) Wess. Boer, 1782 were examined next to “El Volcán” river. In addition, one palm of *O. bataua*, at the “vereda La Leona”, was examined. Palm leaves were dissected using an ax, and the sheath and petiole carefully examined for reduviid specimens.

The municipality of Victoria is located in the northeast of Caldas. The mean annual temperature is 26°C, mean relative humidity is 75%, and mean annual rainfall is 2,000 mm. The surveyed locality is at kilometer 20 on the road from the municipality of La Dorada to the municipality of Norcasia (5°34′30″N, 74°52′05″W), at 780 m elevation. The locality was visited in November 2006 during the rainy season. Six palms of *A. butyracea* were examined. In addition, debris from the sheath and petioles of two palms of *Elaeis oleifera* (Kunth) was examined for presence of insect specimens.

The collected specimens of *P. spissicornis* were deposited in the entomological collection of the American Museum of Natural History, New York, NY, USA [AMNH]; and in the Colección Entomológica de la Universidad de Antioquia, Medellín, Colombia [CEUA].

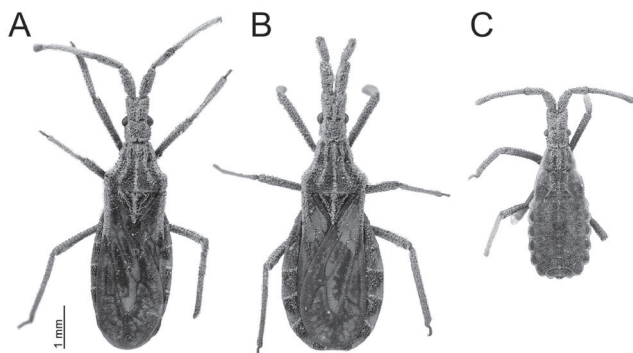


Figure 1. *Phimophorus spissicornis*, habitus, dorsal view. A. Male. B. Female. C. Late instar nymph.

Results

Four adults and one late instar nymph of *P. spissicornis* were collected between the axils of the fronds of *O. bataua* in as-

sociation with adults and nymphs of *R. pallescens* in San Carlos. Two adult specimens of *P. spissicornis* were collected between the sheaths of *A. butyracea* in association with *R. pallescens* in Vegachí. In the six palms of *A. butyracea* surveyed in the municipality of Victoria, only adults and nymphs of *R. pallescens* were found but no specimens of *P. spissicornis*. Surveyed palms of *O. bataua* in Vegachí, and *E. oleifera* in Victoria, harbored neither *P. spissicornis* nor *R. pallescens* specimens.

Examined material. *Phimophorus spissicornis*. 2 M, 2 F, 1 nymph. COLOMBIA, Antioquia, San Carlos, Vereda Jardín, Finca “El Silencio”, 6-feb-1990, Jaramillo N, in *Oenocarpus bataua* [as “*Jessenia polycarpa*”], [1 M, 1 F, 1 nymph, AMNH; 1M, 1 F, CEUA]. 2 F. COLOMBIA, Antioquia, Vegachí, 1 km de la cabecera municipal, “La Piscina” 6°46′01″N 74°47′40″W, 982 msnm, 9-sep-2006, Chaverra D. & Gómez L, [1 F, AMNH; 1 F, CEUA].

Distribution and ecology. The holotype of *P. spissicornis* was collected in Brazil with no specific locality or additional biological information (Bergroth 1886; Wygodzinsky 1948). The specimens from Ecuador mentioned by Carayon *et al.* (1958) also have no detailed locality information. In Colombia, 15 Reduviidae subfamilies are known, with about 95 genera recorded so far (Forero 2004, 2006). This is the first time that the subfamily Phimophorinae is recorded from Colombia.

The palms *A. butyracea* and *O. bataua*, are widely distributed in the country, as well as in Central America and in the Andean region of South America (Henderson *et al.* 1995). The structure of palms, especially the persistent petioles and the large crown of leaves, form a suitable number of microhabitats, which harbor a diverse assemblage of arthropods that use the palms as refuge or permanent habitation (Couturier and Kahn 1992; Delobel *et al.* 1995; Chang and Ling 1998; Gurgel-Gonçalves *et al.* 2006). The arthropods inhabiting these microhabitats may serve as prey for predatory insects like reduviids. The finding of a late instar nymph together with adults in palms more >3 m tall, suggests that feeding of *P. spissicornis* occurs in these microhabitats. We were unable to determine the prey preference of *Phimophorus* in the field, however, because of the large number of arthropods present in the axils of the palms.

The presence of *P. spissicornis* on bananas and bromeliads suggests that palms may not be the only habitat for this species. Nonetheless, it is not known if *P. spissicornis* is common in those habitats or merely a casual encounter. Finding adults of *P. spissicornis* on two palm species, in two localities separated from each other by > 50 km, in similar ecological conditions, as well as the discovery of a nymph, reinforces the idea that the microhabitat formed among the leaves of the palm species, may offer adequate conditions for the development of *P. spissicornis*.

Specimens of *P. spissicornis* in Colombia were always associated with *R. pallescens*. The association of *P. spissicornis* with species of Triatominae has been shown previously with *Microtriatoma borbai* Lent and Wygodzinsky, 1979 (Borboderini) (Lent and Jurberg 1977; Lent and Wygodzinsky 1979). Our report of a second instance of association of *P. spissicornis* in the same habitat with another species of Triatominae is remarkable, although the nature of this association will depend on further research.

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Literature cited

- BARBER, H. G. 1932. A new species of *Rhodnius* from Panama (Hemiptera: Reduviidae). *Journal of the Washington Academy of Sciences* 22: 514-517.
- BERGROTH, E. 1886. Zur Kenntniss der Aradiden. *Verhandlungen zoologisch-botanischen Gesellschaft in Wien* 36: 53-60.
- CARAYON, J.; USINGER, R. L.; WYGODZINSKY, P. 1958. Notes on the higher classification of the Reduviidae, with the description of a new tribe of the Phymatinae (Hemiptera: Heteroptera). *Revue de Zoologie et Botanique Africaines* 57 (3-4): 256-281.
- CHANG, C. Y.; LING, N. F. 1998. Caracterización biológica y de uso de palma real (*Attalea butyracea* mutis ex l.f.) en 6 comunidades del área de conservación amistad pacífico, Costa Rica. Área de conservación amistad pacífico. Instituto Nacional de Biodiversidad, Costa Rica. 25 pp. Web site: http://www.inbio.org/EN/es/estudios/PDF/Informe_PalmaReal.pdf. [Fecha último acceso: 14 enero 2008].
- COUTURIER, G.; KAHN, F. 1992. Notes on the insect fauna on two species of *Astrocaryum* (Palmae, Cocoeae, Bactridinae) in Peruvian Amazonia, with emphasis on potential pests of cultivated palms. *Bulletin Institute Frances Etudes Andines* 21 (2): 715-725.
- DELOBEL, A.; COUTURIER, G.; KAHN, F.; NILSSON, J. A. 1995. Trophic relationships between palms and bruchids (Coleoptera: Bruchidae: Pachymerini) in Peruvian Amazonia. *Amazoniana* 13 (3-4): 209-219.
- FORERO, D. 2004. Capítulo 5. Diagnóstico de los géneros neotropicales de la familia Reduviidae (Hemiptera: Heteroptera), y su distribución en Colombia (excepto Harpactorinae). p 128-275. In: Fernández, F.; Andrade, G.; Amat, G. (eds.). *Insectos de Colombia*, Vol. 3. Bogotá D. C., Colombia. 425 p.
- FORERO, D. 2006. New records of Reduviidae (Hemiptera: Heteroptera) from Colombia and other Neotropical countries. *Zootaxa* 1107: 1-47.
- GURGEL-GONÇALVES, R.; PALMA, A. R. T.; MOTTA, P. C.; BAR, M. E.; CUBA, C. 2006. Arthropods associated with the crown of *Mauritia flexuosa* (Arecaceae) palm trees in three different environments from Brazilian Cerrado. *Neotropical Entomology* 35 (3): 302-312.
- HANDLIRSCH, A. 1897a. Ueber *Phimophorus spissicornis* Berggr. Ein hemipterologischer Beitrag. *Verhandlungen zoologisch-botanischen Gesellschaft in Wien* 47: 408-410.
- HANDLIRSCH, A. 1897b. Zur systematischen Stellung der Hemipterengattung *Phimophorus* Bergroth. *Verhandlungen zoologisch-botanischen Gesellschaft in Wien* 47: 558-560.
- HENDERSON, A.; GALEANO, G.; BERNAL, R. 1995. *Field guide to the palms of the Americas*. Princeton University Press. Princeton, NJ. 352 p + 64 plates.
- LENT, H.; JURBERG, J. 1977. As ninfas de quinto estágio de *Phimophorus spissicornis* Bergroth, 1886 (Hemiptera, Reduviidae). *Revista Brasileira de Biologia* 37 (3): 521-524.
- LENT, H.; WYGODZINSKY, P. 1979. Revision of the Triatominae (Hemiptera, Reduviidae), and their significance as vectors of Chagas' disease. *Bulletin of the American Museum of Natural History* 163: 125-520.
- MALDONADO, C. J. 1990. Systematic catalogue of the Reduviidae of the World. *Caribbean Journal of Science, Special publication 1*, University of Puerto Rico. Mayagüez, Puerto Rico. 694 pp.
- MILLER, N. C. E. 1956. A new subfamily of Reduviidae (Hemiptera-Heteroptera) from the Solomon Islands. *Annals and Magazine of Natural History* 12 (9): 587-589.
- SCHUH, R. T.; SLATER, J. A. 1995. *True bugs of the world (Hemiptera: Heteroptera). Classification and natural history*. Cornell University Press. Ithaca, NY. 336 pp.
- USINGER, R. L. 1943. A revised classification of the Reduivoidea with a new subfamily from South America. *Annals of the Entomological Society of America* 36: 602-618.
- USINGER, R. L.; WYGODZINSKY, P. 1964. Description of a new species of *Mendanacoris* [sic] Miller, with notes on the systematic position of the genus (Reduviidae, Hemiptera, Insecta). *American Museum Novitates* 2204: 1-13.
- WEIRAUCH, C. 2008. Cladistic analysis of Reduviidae (Heteroptera: Cimicomorpha) based on morphological characters. *Systematic Entomology* 33: 229-274.
- WYGODZINSKY, P. 1948. On some Reduviidae belonging to the Naturhistorisches Museum at Vienna (Hemiptera). *Revista Brasileira de Biologia* 8 (2): 209-224.

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